DRAFT

Fermilab Accelerator Advisory Committee
Report of the Meeting of May 10 – 12, 2005

Committee: John Corlett (LBNL), Georg Hoffstaetter (Cornell), Jean-Pierre Koutchouk (CERN), Shin-ichi Kurokawa (KEK), Steve Peggs (BNL), Thomas Roser (BNL, Chair), Lucio Rossi (CERN), Sami Gamal El-Din Tantawi (SLAC, for R. Ruth), Gunther Geschonke* (CERN), Kwang-Je Kim* (ANL), Tor Raubenheimer* (SLAC),
Apologies: Stephen Milton (ANL), Michiko Minty (DESY), Ronald Ruth (SLAC), Swapan Chattopadhyay* (TJNAF), Hans Weise* (DESY)
Excused as presenter: Hasan Padamsee* (Cornell)
* new FAAC member
DOE observer: Phil Debenham (DOE)

Assignments:

Presentations:	Charge item:	Committee members:
ILC component of SMTF	1.A	Hoffstaetter, Kurokawa, Tantawi, Raubenheimer
PD component of SMTF	2.	Peggs, Koutchouk, Geschonke
3.9 GHz, FNPL	1.D	Corlett, Kim
Overall plan for SMTF, HPTF	1.BC	Rossi, Roser

Introductory Remark

The Committee would like to thank all the presenters for the very interesting and excellently prepared presentations. It is always a pleasure to come to Fermilab and learn about the many exciting accelerator physics projects.

General Comments

Fermilab was presented with a proposal by an international collaboration to establish a Superconducting Module & Test Facility (SMTF) at Fermilab. Such a facility will provide the necessary infrastructure to develop and test superconducting rf technology in the US for the International Linear Collider (ILC), for a possible future superconducting linac-based Proton Driver (PD), and for several other accelerator projects and will draw, through its collaboration, on existing expertise in SCRF technology in the US and abroad.

This Committee was asked to review the ILC and PD component of this facility. The estimated cost for SMTF was presented as $145M and $66M for the ILC and PD component, respectively. Overall the Committee strongly supports the establishment of SMTF at Fermilab to develop high gradient superconducting cryomodules for the ILC and develop SCRF technology for the PD. The Committee endorses the Fermilab plan to submit a proposal to DOE.

The Committee believes that a well planned and adequately funded program of SMTF will establish the technical capabilities in SCRF in the US and at Fermilab to support a credible bid to host the ILC.

The ILC Global Design Effort has listed two main, high priority items for ILC R&D: cavity development to reliably achieve around 35 MV/m with Q ~ 0.5-1e10 and string test of a basic building block of the main ILC Linac. The presented SMTF is expected to deliver on the second item by building four cryomodules and perform a system test with ILC-type beam; the basic building block of the ILC main linac will consist of a RF system powering 2 to 3 cryomodules. With regard to the first item the Committee recommends that Fermilab leads a systematic program to develop cavity processing with the goal of achieving the ILC required performance, around 35 MV/m, in most (~95%) cavities.

The significant number of cavities and cryomodules that are being fabricated as part of SMTF provide an important opportunity to involve industry in the process. Successful industrialization is essential to the ILC project. The Committee strongly encourages Fermilab to organize, as soon as possible, a workshop with industry from the US and abroad on strategies for early industrial involvement in the cost effective production of cavities and cryomodules.

The Committee is happy to see that the persistent work on photoinjector and superconducting rf at Fermilab has provided a strong basis of the participation in ILC.

The PD component of SMTF consists mainly of a prototype 110 MeV front-end of the H^- superconducting linac. This prototype will allow for a stringent system test of a single klystron driving multiple cavities using the newly developed IQ modulators to individually adjust phase and amplitude. A successful test would establish the technical basis for the superconducting Proton Driver proposal. The Committee supports the inclusion of the PD components in SMTF.

ILC component of SMTF

Management

Since much of the expertise in SCRF research and industrialization is currently in Europe and Japan, the capabilities of US laboratories and industry in high gradient, high-Q, and high-reliability superconducting accelerating structures, related systems and their industrialization have to be improved if an US bid for the ILC should be made. The presented goals, including the development of high gradient superconducting cavities and cryomodules, their test with ILC-type beams, and the industrialization of cryomodule production are developed well on a general level, if not in detail yet. The management and personal structure of the SMTF collaboration is starting to be defined, and the committee encourages the direction this development is taking in that it draws as much as reasonable and possible on the existing expertise and infrastructure for SCRF technology at other laboratories in the US and worldwide. The detailed roles of collaborating laboratories are starting to be defined and the committee encourages the upper management of FNAL to draw in international laboratories, especially DESY, INFN and KEK as fast as possible.

Fermilab and the SMTF collaboration have progressed on many of the issues raised by the last AAC. It was advised that Fermilab establishes those projects that are most relevant for FNAL, i.e. the ILC and the PD, as clear priorities, and the committee is pleased to see that that has been done effectively.

It was encouraged to clearly define perspectives for the level of expertise in SCRF technology to be developed at FNAL, and it is good to see that perspectives have become much clearer, especially concerning the cryomodule construction. It is encouraged to define clear goals also for the developments of cavities, for the RF distribution up to the input couplers, and for the beam based measurements, including measurements of beam properties.

The time line asks for a start of ILC construction in 2010. Achieving all goals of the SMTF at that time seems very ambitious. Without a resource loaded schedule and a clear definition of the studies that will have to be performed and a clear definition of the steps that have to be taken toward industrialization, the committee is not able to evaluate whether a completion in 2010 is possible. We therefore recommend to clearly define goals and milestones, and to develop a resource loaded schedule for the SMTF collaboration as soon as possible.

The SMTF is envisioned to draw together the SCRF experts of US and international laboratories. It is therefore very welcome that the management structure includes experts of collaborating institutions on a high level. This seems essential to guarantee that the collaborative structure is successful.

Recommendations

- FNAL should contribute as fast and as much as possible to the definition of a baseline configuration document for the SCRF parts of the ILC.
- Detailed goals, milestones, and a plan of beam tests should be developed quickly.
- A resource loaded schedule should be developed that is compatible with an ILC construction start at 2010.

Cavity development

One of the issues critical for the ILC will be the development of a 'recipe' for fabrication of the high gradient cavities. At present, the yield of cavities with gradients around 35 MV/m is poor for reasons that are not fully understood. To be able to specify a gradient for the ILC design, the yield versus gradient needs to be clarified.

The SMTF collaboration recognizes the need to study the cavity fabrication process but has not yet fully developed a plan to attack this problem. The model that was presented involved making use of existing facilities at Cornell, Jlab, and SLAC as well as a new BCP facility at Argonne. In this model, an electro-polishing facility would be established at Fermilab or Argonne in late 2007 or 2008 and an e-beam welding facility would be constructed on a similar timescale. Fermilab has started an excellent collaboration with local laboratories and universities to analyze the superconducting materials. The committee encourages a close collaboration of FNAL and ANL on the issue of cavity treatment as well as on other issues that are relevant to SMTF. Especially it should be investigated whether the EP for RIA at ANL could be extended to ILC cavity treatment.

The development of a high gradient cavity fabrication recipe is critical. This development should be divided into two stages: first, the very promising technique of electro-polishing needs to be further developed to improve the yield of high-gradient cavities, and, second, alternate approaches to the cavity fabrication need to be considered. There are R&D efforts at Cornell, DESY, KEK, and Jlab to consider alternate cavity geometries and/or alternate fabrication approaches such as using single-crystal niobium. These efforts should be encouraged. However, to make rapid progress on the first topic, a large scale systematic study needs to be initiated. In

such a study, all of the variables in the process need to be controlled and then small variations to the established procedure should be explored. To perform such a study, there needs to be a tight feedback loop where cavities can be fabricated, processed, and measured in vertical tests - measuring fully dressed cavities in horizontal
tests as part of this tight feedback loop is probably not necessary. It is believed that Fermilab is in an excellent position to drive such a program. It would build on the excellent work that has been started qualifying the superconducting materials as well as the facilities that are being constructed at ANL and FNAL. This program should be given high priority and critical people should be identified to lead the effort.

Recommendations

- Investigate the extension of the ANL EP to ILC cavities.
- Clearly define of how FNAL will drive the tight loop of cavity fabrication.

Cryomodule development

Clearly a successful SMTF has to demonstrate a cryomodule close enough to the requirements of an ILC module including functionality, efficiency, and cost. This is most likely not the DESY type III design. Plans were presented for the production of a DESY type III cryomodule with only minor modifications. This would be succeeded by the assembly of DESY parts to a second type III cryomodule, and then the construction of two yet to be defined type IV cryomodules which would be much closer to the needs of the ILC. In light of the time and financial pressure, the committee is not convinced that this is the most efficient strategy. We encourage the investigation of different strategies, an example could be to obtain parts from DESY as fast as possible for assembly of one type III cryomodule. The addition of only two type IV modules with high-gradient cavities could then already provide for a test of a full basic ILC RF unit.

Recommendations

- Reevaluate the types of cryomodules that should be built.

Other challenges

In view of financial pressures, it is clear that the R&D efforts have to be concentrated on the development of high-gradient reliable cavities and associated cryomodules. From the presentation it was clear that the resources and efforts are being aligned in this direction. However, even if the emphasis of the SMTF is not going to be on other aspects of the system, at least at the beginning, it is very important that they pay attention to the details of the RF systems in general. These systems are needed for a successful experimental program. It is important to learn as much as possible from the TTF RF system and operation experience. To this end, the people that are going to be responsible for this system should be identified as soon as possible, hence, the need to rush the design and construction of these auxiliary system and the chances of mistakes and shortcomings would be reduced.

A cost effective reliable fundamental mode coupler is essential for a successful ILC. Although the research on this topic is being conducted elsewhere, eventually this research will have be integrated into the SMTF. Although this might not be immediate, it is advisable that the Fermi-Lab would get involved in this research. Hence, there should be a global view of the developments from the point of view of the cavities and the cryomodule from one side and couplers and the rest of the rf system from the other side. It would be helpful if some body or a group is identified to perform this bridge function.

Recommendations

- Ongoing work on input coupler optimizations should be integrated into cryomodule develpments.

Industrialization

Industrialization of ILC components is of great importance and must be on the schedule for the construction of the facility. Also FNAL needs to devise a clever way of industrialization to reduce the cost of the ILC. Before the start of the construction there should be multiple vendors who can fabricate cavities and complete cryomodules that satisfy the specifications of ILC; this means that the process of industrialization should be started soon and budget should be allocated for this purpose. Since industrialization is not at all easy and needs close contact between institutes and industry, the committee suggests that, as the first step, an international workshop on industrialization of ILC be held not far from now and we encourage that FNAL drives the organization of the workshop. In this workshop, there should be strong participation by researchers and engineers both from institutes and industry not only of the US but also Europe and Asia. It is encouraged that the workshop covers not only the industrialization of cavity and cryomodule production but also includes RF system components like input couplers. But it should be clearly defined which parts of the industrialization should finally be pursued in the SMTF framework.

The industrialization of the cavity fabrication needs to be considered in detail. Opportunities to automate the processing procedures should be explored and industry should be engaged during the development of the cavity fabrication recipe. Although the cavity fabrication recipe is not fully developed, the present recipe is not likely to change in a major way and the early industrial involvement will not be a wasted effort.

To fully achieve industrialization of ILC is beyond the scope of SMTF and needs clear initiative taken by ILCSC and GDE; however, it should be reminded that the SMTF project should be managed to facilitate industrialization of those parts that are pertinent to it as much as possible.

Recommendations

- Organize an industrialization workshop soon.
- Clearly define the scope and cost of the industrialization effort.

PD component of SMTF

Overall the committee is very supportive of the plan to use the SMTF to test the key technological elements that would allow a Proton Driver project to proceed with confidence. The PD program includes a set of innovative solutions (superconducting acceleration from low energy, superconducting solenoidal focusing, distribution of the RF energy from a common source through fast phase shifters, et cetera) that is part of the justification of this program, as precursors of new or expanded technologies.

Only a few months ago the phase shifters were still only at the level of speculation. Now, they are being tested in several implementations with promising first results and anticipated final results by the end of this year. While work remains to be done, we would like to congratulate the whole PD team for their enthusiasm, determination, and first results. This is an exciting activity that is being followed by a broad audience.

There is significant synergy between the PD and ILC R&D, in that the longest PD acceleration section, where beta = 1, relies on ILC RF cryomodules operating at a reduced gradient (around 27 MV/m instead of around 35 MV/m). Such modules can be anticipated to be naturally produced in the learning and training cycle of the ILC R&D phase. The beta = 1 structures are well within the present state of the art, and don't require any PD-specific development. They are covered by the ILC module development program.

Although limited beam tests could be contemplated at an existing facility (such as the SNS), the large synergy with ILC makes the SMTF the natural place to efficiently develop and demonstrate the feasibility of a PD. The committee thus supports the inclusion of the PD R&D program into the SMTF collaboration objectives as particularly suitable. The low energy front end of the PD, as proposed, is an excellent test bench.

A recent directors review of the PD project (March 2005) looked at great length into a broader set of technical issues than those which will be directly addressed at the SMTF, or which were presented to the committee. However, these broader issues indirectly extend into the SMTF PD program. For example, some of the RF stability parameters derive from Main Injector transition crossing performance, and the RF pulse length is intimately connected to the Main Injector injection scheme.

Although we were not presented with a discussion of front end beam quality, it is desirable that PD front end tests include a comparison of actual beam quality performance with requirements. Critical items that are important for upgrade from 0.5 MW to 2 MW beam power (such as the input couplers) should be clearly identified.

The source, RF quadrupole, and front end section rely on components and technologies developed or being developed in various laboratories. This naturally lends itself to a multi-laboratory collaboration, as presented by the SMTF proponents. While the challenges on components (such as klystrons, modulators, and fast phase shifters) are numerous, they seem well identified.

The integration task is very challenging, especially for the LLRF control of the components in the front end. This underlines the critical aspect of the need for a front end demonstration, sufficient to address the anticipated difficulties, and to study front end acceleration performance and stability with a pulsed beam. The required RF pulse length is 4.2 ms at a 2.5 Hz repetition rate, and 1.4 ms at 10 Hz. This is much longer than the SNS pulse length of about 1 ms (at 60 Hz), and exposes the modulator and klystron to much greater pulsed power stresses, especially as one klystron feeds many cavities. The peak power per klystron is in the range 5 MW to 10 MW, in contrast to about 600 kW at the SNS, where there is one klystron per cavity. Klystron and modulator performance are key elements that need to be proved in the SMTF tests of the PD front end. This includes not only peak performance, but also reliability, availability, and time-to-recover after exceptional incidents. The committee agrees that proving the klystron performance is likely to be more difficult than proving the modulator performance.

The nominal plan is for a single klystron to power both room temperature and superconducting cavities in the 110 MeV front end. This klystron is an "off the shelf" item, thanks to the JPARC project. A back up plan is to use two klystrons -- one for the warm cavities, and one for the cold. This might be necessary because the cavity-by-

cavity fast phase shift control (implemented by the IQ modulators) is so different between warm and cold cavities. Even if two klystrons are necessary for the front end, the number of cavities per klystron may remain unchanged in the main beta = 1 section. And even if twice as many klystrons are needed in the main section, the impact on total project cost is modest.

Fast phase shift control of individual cavities driven by a single klystron is critical in cost control of the PD project. This technology is also potentially important in optimizing the efficient feeding and filling of ILC cavities. The challenge of demonstrating fast phase shift control is exacerbated in the front end, where the low-beta beam dynamics means that the accelerated protons undergo a relatively large longitudinal synchrotron phase advance. (The beams are longitudinally rigid -- do not oscillate in longitudinal phase space -- for most practical purposes, in the higher energy beta = 1 sections of the PD, or ILC.) We agree that, if successful, the SMTF full beam power full gradient tests will validate the proposed fast phase shifter scheme throughout the length of the PD, so long as these tests also include IQ modulator tests at 1.3 GHz on cryomodules with many cavities, as well as at 325 MHz in the front end.

We also agree that it is vital to demonstrate the "multi-channel" integrated performance of the fast phase shifters, LLRF controls, microphonics and Lorentz force compensation, and feed back systems. It is possible that each fast phase shifter channel is coupled in a complicated way with its neighbors.

These full power beam tests should also address error performance -- exception handling -- even though these are not strictly key technical elements required to allow a construction start near the end of this decade. Another secondary goal of the SMTF PD program should be to develop as far as possible the agreement between reality and multiple modeling and simulation codes, including beam dynamics and (separately) electronic modeling. Generic tool development would benefit the ILC as well as the PD project. Yet another secondary goal is to consider the alternative of using conventional quadrupole focusing in the front end, in place of the 5 to 6 Tesla superconducting coils in the nominal plan. This would include a simulation study of beam halo development, and emittance growth.

Another key element is the (world first) demonstration of successful operation of superconducting spoke resonator cavities (325 MHz) with full beam currents. While this does not seem to be a high risk element of the PD project, nonetheless it is critical.

3.9 GHz, FNPL

The committee supports the inclusion of beam tests of the ILC cryomodules as an important aspect of the SMTF proposal. The beam experiences fields in the cryomodule not necessarily well characterized by electromagnetic modeling or rf measurements, and beam tests can provide a true indication of the integrated fields experienced by a train of bunches. These measurements may provide valuable information regarding wakefields, beam energy, tests of the low-level rf systems, and test of use of higher order modes (HOMs) as beam position monitor signals.

The existing photoinjector FNPL has proved to be a valuable resource in beam physics and advanced accelerator R&D. Recent activities have included production and control of angular-momentum dominated beams and flat beams, development of optical diagnostics using

coherent radiation, development of cooled rf gun for polarized electron production, and plasma focusing techniques. The experimental program of FNPL is applauded and recognized as a significant contribution to the field. LLRF, piezo tuning, and thermal mapping of cavities have been developed under the auspices of FNPL, and the committee supports further development in these areas in conjunction with SMTF needs in support of ILC and PD.

Plans to upgrade the FNPL would allow for higher energy beams by adding a second 9-cell TESLA cavity. The beamline would be re-arranged and extended and would allow for tests of 3.9 GHz cavities.

The 3.9 GHz cavity development program has been Fermilab's most significant involvement in scrf development to date. TM010 mode cavities have been designed and tested, with application in linearization of the correlated energy spread in a bunch prior to bunch compression. Longitudinal mode cavities are being fabricated by FNPL for delivery to TTF-II. TM110 mode cavities have been designed and tested, with application as diagnostics in "streaking" bunches.

The committee applauds the work done in developing these cavities, and recognizes their potential in many applications, but does not see a strong role for this activity in the context of the ILC program.

Plans to move the FNPL to the SMTF at the New Muon Area as beam source for the ILC cryomodules involve significant modifications to achieve the ILC beam parameters. Upgrades to the FNPL for application in SMTF include a new gun and upgraded modulator to allow for the longer 1.5 ms rf pulse, and modifications to the lasers system (amplifier stages and Pockel cell).

The committee supports the provision of electron beams with ILC-like parameters at the SMTF, and also supports the development of FNPL as an R&D center. While the timescale may be stretched, the SMTF staff may consider the advantages of a new simplified injector for SMTF at some relatively small additional cost, and maintaining the R&D activities at the FNPL at A0 independently of SMTF operations.

Overall plan for SMTF, HPTF

Strategic approach for cryomodule production and testing in view of the existing capabilities within national laboratories and Universities, and the adequacy of the proposed support infrastructure.

The SMTF collaboration has done remarkable progress in becoming one of the major players in the ILC both inside USA and on a world scale and it is now considered a key actor. While the effective engagements and definitions of responsibilities of various collaboration members are obviously in an initial phase (MoUs are under discussions) it appears there exists a broad consensus on the global amount of work to be done and –even more importantly - on the split among different Institutions forming the collaboration. Of utmost importance for the US, and for this lab, is the recognition that Fermilab should play the central role for the SMTF: however the collaboration wisely made best use of all resources and labs around the US. The fact that the SMTF requires the completion or the upgrade of facilities at other lab and institutions helps forming a genuine spirit of collaboration. An atmosphere of collaboration in the US may be a key factor for the ambition of Fermilab to host the ILC. The SMTF can be the mechanism where new international collaborations are effectively developed by proposing to participate in a real "hardware program". This is an extremely positive aspect of SMTF.

Two remarks on the strategic approach:

1) While the SMTF was at the beginning essentially a collaboration to built and use an infrastructure, today it seems the appropriate body that can help to fill the gap that is still needed to reach reliably the level of 35 MV/m first in cavities and then in cryomodules. We encourage Fermilab to have a stronger participation also in the optimization of the cavity process, by anticipating, as much as possible, the building of an internal infrastructure for EP by making the best use of the common cleaning facility at ANL and by reinforcing the cavity processing tight loop inside the SMTF program. Indeed there is a wide consensus among the committee members that the success of the cryomodule program and of the industrialization may critically depend on a serious engagements of Fermilab, inside the SMTF collaboration, on the assessment of the cavity processing. The committee invites Fermilab to aggressively define its role and the role of each collaboration member on the improvement of cavity processing.

2) While the exercise of the cryomodule assembly by using components from DESY is certainly a necessary step, the committee is split on the necessity to start building today a full US cryomodule of 3rd generation or instead of this construction start to design and engineer the 4th generation. The committee on this point can only recommend that a decision is taken shortly, by weighing the factor that cavity processing may be the critical item and that the cryomodule assembly is where more saving in labor are sought.

As for the adequacy of the infrastructure one notes the new lay-out that now includes the New Muon Lab (NML) as host of the ILC beam test facility. The new lay-out is certainly more suitable. Radiation protection – an important issue for the high intensity beam that will eventually be accelerated in the ILC facility – is much easier to handle in NML than in Meson lab. Furthermore in this way the destiny of the PD and of the ILC are less coupled as far as the hardware (and cryogenics) is concerned, which might be advantageous in the future for the Lab. However one should notice that Fermilab is engaging on four fronts (IB1 of TD for horizontal cavity test, Meson Lab, NML and the CAF in hall MP9). Especially the cryogenics plant for NML, which has to be started from scratch and requires a temporary solution to avoid delays in testing, may need a considerable amount of resources. Technically the solutions presented are sound, well founded and shows again that Fermilab with its expertise in superconducting testing facilities, cryogenics and infrastructure is the natural host for such a task. The committee congratulates the Lab for the great effort done in the last months to identify the areas and to proceed to quickly remove existing equipment and clean out the area. The resources on this point seem adequate and well distributed.

Relationship between the SMTF plan and a more comprehensive US industrialization plan in support of the ILC construction.

Not much has been done yet to transform the preliminary thoughts and ideas into guidelines and then to implement them into a program that can be part of the SMTF or of the ILC-Americas.

Many issue are open and we encourage to collect the experience that already exists with other large projects around the world. The committee strongly supports the idea of a workshop that might be a milestone in defining the industrialization strategy for ILC and for ILC-Americas in particular. This strategy will certainly have an impact on the SMTF activities and as such we recommend that provisions are made to provide a significant budget for this. However it may also come out that the industrialization be carried out mainly outside the SMTF and in order to define this we believe that a workshop is the right forum. Indeed if industrialization is too early a part of SMTF this may hamper the participation of non-US member in the SMTF collaboration and can be a source of friction.

Some issues, however, have an impact on some early choices of the SMTF: how many companies should be involved in the various processes? at what level? (work in the lab vs. work in industry supervised by labs, go to industry not too late but also not too early,…) , etc. Whatever the answer to these questions are SMTF must be made available as a training bed and the collaboration should have a nucleus of people that promotes this with the scope to reduce the cost.

Appendix

Fermilab Accelerator Advisory Committee
May 10-12, 2005

Charge (Draft Rev. 4)

Fermilab has received a proposal for the construction and operation of a Superconducting Module Test Facility at Fermilab. The associated development and testing program would support the International Linear Collider and Proton Driver R&D programs, both of direct interest to Fermilab, and other superconducting rf based programs of potential interest within the DOE and NSF. Fermilab is currently evaluating this proposal with a goal of forwarding to the funding agencies a specific proposal for support of the ILC and Proton Driver programs. Such a proposal needs to reflect the interests and goals of Fermilab, the collaborating institutions, the ILC Global Design Effort, and the agencies. The May 2005 AAC meeting will concentrate on evaluation of the goals, scope, and planning for the ILC and Proton Driver programs within the SMTF context.

The Fermilab Accelerator Advisory Committee is asked to review, comment on, and offer recommendations as appropriate with particular attention in the following areas:

1. Review the goals of the ILC component of SMTF. As presented do the elements form the basis of a program which will allow the U.S. to establish the technical capabilities in SCRF required to support a bid to host the ILC? Please also consider the following areas and offer comment as appropriate:
    - The "deliverables" that the ILC GDE can expect to receive from this program and their projected influence on the ILC design and/or preparations for construction.
    - The strategic approach outlined for cryomodule production and testing in view of the existing capabilities within the national laboratories and universities, and the adequacy of the proposed supporting infrastructure and resources.
    - The relationship between the SMTF plan and a more comprehensive U.S. industrialization plan in support of ILC construction.
    - The role of the photoinjector and its upgrades within the ILC program.
2. Review the goals of the Proton Driver component of SMTF. Identify elements that form the core of a program which would allow Fermilab to establish the technical basis required for a construction start near the end of the decade. Comment on the strategic approach outlined and the adequacy of the proposed supporting infrastructure and

resources.

As usual the committee is invited to issue comments or suggestions on any aspect of the programs discussed beyond those specifically included in this charge. It is requested that a concise report responsive to this charge be forwarded to the Fermilab Director by June 17, 2005. Thank you.

Fermilab Accelerator Advisory Committee
Agenda
May 10-12, 2005
Comitium, Wilson Hall 2SE
Revision 23-April-2005

Tuesday, May 10

8:30-9:00	Committee Executive Session	T. Roser
9:00-9:15	Welcome and Presentation of Charge	S. Holmes
9:15-9:45	SMTF Proposal and Collaboration Overview	N. Lockyer
9:45-10:15	Technical Goals of the Collaboration	H. Padamsee
10:15-10:30	Discussion	
10:30-10:50	Break	

ILC (Organized by Shekhar Mishra)

10:50-11:20	ILC R&D Overview	S. Mishra
11:20-11:45	ILC Cryomodule Fabrication Strategy	H. Carter
11:45-12:00	Discussion	
12:00-1:00	Lunch	
1:00-1:20	ILC RF Sources	C. Adolphsen
1:20-1:35	RF Power Distribution and LLRF Development	B. Chase
1:35-1:50	Thoughts on Industrialization	W. Funk
1:50-2:10	Resources and Schedule	H. Carter
2:10-2:45	Discussion	
2:45-3:00	Break	

Proton Driver (Organized by Bill Foster)

3:00-3:30	Proton Driver R&D Overview	G. W. Foster
3:30-3:50	$\beta < 1$ R&D	G. Apollinari
3:50-4:10	RF Power R&D	D. Wildman
4:10-4:30	Resources and Schedule	R. Stanek
4:30-5:00	Discussion	

5:00-6:30	Committee Executive Session. Requests for supplementary or breakout presentations on Wednesday
7:00	Dinner

Wednesday, May 11

Photoinjector and Associated R&D (Organized by Helen Edwards)

8:30-9:00	Photoinjector Development Plan and R&d Program	P. Piot
9:00-9:15	Materials Research	P. Bauer
9:15-9:30	Capture Cavity and LLRF Development	A. Brandt
9:30-9:45	Piezo Studies and Temperature Measurements	R. Carcagno
9:45-10:00	Discussion	
10:00-10:20	Break	

Cavity and Cryomodule Fabrication and Testing Facility (Organized by Harry Carter)

10:20-10:40	MP9 Facility Plans	T. Arkan
10:40-11:00	Horizontal and Vertical Test Stands at MTF	T. Peterson
11:00-11:20	BCP Facility @ ANL	M. Kelley
11:20-11:40	Discussion	

High Power Test Facility (Organized by Peter Limon)

11:30-12:00	Overview of the HPTF Plan	P. Limon
12:00-1:00	Lunch	
1:00-1:20	Cryogenics Status and Plans	J. Theilacker
1:20-2:00	Discussion and Break	
2:00-5:00	Supplementary presentations and/or breakout discussions as requested by the committee. Committee Executive Session	

Thursday, May 12

8:30-11:00	Committee Executive Session
11:00-12:00	Closeout
12:00	Adjourn